

Community Input Solicited by the JDEM Science Coordination Group

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The scientific community and the public were given the opportunity to make comments on the above JDEM reference design to the Science Coordination Group via the JDEM website.

The comments are categorized as follows:

- Reference design recommendations/concerns
- Possible collaboration with other missions
- General

The comments included in this section are summarized, as many of them are lengthy, and are representative of the total comments received. Direct quotes from some of the comments posted in this summary are noted. The complete set of requirements is in Appendix A to this section. The names of those commenting have been withheld, as the premise was the authors would not be identified.

Reference design recommendations/concerns:

The majority of the comments addressed concerns with either pixel scale range, pixel limitations or wavelength coverage. The following identifies concerns as well as suggested improvements.

- 1) "Inadequate plate scale of 0.4 arcseconds per pixel impacts both ability to separate stars and galaxies and Weak Lensing (WL.)"
- 2) "Worried about the 7000 Angstrom cut-off suggested that would presumably affect photometric redshift accuracies."
- 3) "Plate scale of 0.4 arcseconds per pixel far from diffraction limit over most of wavelength range and only marginally better than ground. Make plate scale range 0.1-0.2 arcseconds per pixel and compensate for slower speed by adding pixels. Recommend focusing on 0.2" plate scales instead of degrading spatial resolution of JDEM."
- 4) "Too much compromise on pixel scale for sake of area. Negative impact on weak lensing measurements... Recommend plate scale of no more than 0.15"/pix, which will give critical sampling in the H-band."
- 5) "Plate scale should be at least Nyquist sampling the diffraction limit."
- 6) "I'm particularly concerned that the plate scale, wavelength range, and number of pixels under discussion may not enable a weak lensing program of the power envisioned for a space-based stage IV project."
- 7) "Add pixels. Poor resolution at 0.2 arcsecond pixels."

- 8) "I am concerned about the fact that visible detectors are left only as a possibility, resulting in a nominal plate scale larger than 0.2"/pixels (for the HgCdTe detectors)."
- 9) "Hence, even the optimistic plate scale of 0.2" means an under-sampling by a factor 2. I am optimistic that with a combination of dithering and PCA PSF interpolation it would be possible."
- 10) "I am concerned by the impact of the new concept on various science goals caused by the lower resolution and the lack of optical bands."
- 11) "Current reference mission parameters are very unresponsive to main recommendations of BEPAC committee."
- 12) "Unless an optical capability is added, JDEM will rely heavily on ground-based optical imaging for photometric red shifts in lensing and possibly to distinguish single line emission red shifts in the BAO. Not clear can be done on ground."
- 13) "In my opinion, it is not just that the new JDEM means less ambitious science goals, it is essentially that the core science could be affected at a level which could make JDEM not dramatically superior to ground based surveys, unlike what we would have hoped initially."
- 14) "I hope you will bear in mind the importance of enabling a filled survey area. A sparsely sampled survey area would compromise the ability to identify clusters of galaxies and thereby remove a promising and powerful dark energy probe that could piggy-back on the lensing survey observations."
- 15) "I am worried that in combining these experimental goals you will end up deciding to design a mission which is very expensive, which will require a very prolonged development phase, and worst of all, will lead to an instrument whose compromises prevent optimization at any one task and prevent elimination of systematic errors."

Response to Reference design recommendations/concerns

The comments from the external community were reviewed during the SCG process and were considered during the development of the reference mission. Multiple reference mission concepts were studied with the SCG and the current reference mission addresses many of the design recommendations/concerns. The current reference mission has three different instrument channels with three different pixel scales. This includes the addition of a visible capability that increases the wavelength coverage. The current reference mission covers a wavelength range of 0.4 – 2.0 μm . The visible imager contains 110 Mpixel at a pixel scale of 0.195 arcseconds per pixel. The near infrared imager contains 32 Mpixel at a pixel scale of 0.25 arcseconds per pixel. The two near infrared spectrometers each contain 16 Mpixel at a pixel scale of 0.50 arcseconds per pixel.

Possible collaboration with other missions

- 1) "Use TPF-O concept for both terrestrial planet finding and DE. Concept uses a 4-m, optical-NIR telescope combined with an external occulter to block light from the star during its search for terrestrial planets."

- 2) “The requirements for a space-based micro lensing mission are very similar to the requirements for several proposed JDEM missions, and thus such a mission could be used to achieve many of the science returns of a stand-alone micro lensing mission.”

General

- 1) “Is there any interests in CMB-LSS correlation? “
- 2) “CNES has talked to Weiler about providing an IFU spectrometer. Why no mention on the JDEM web site?”
- 3) “How can NASA measure EHV in Gerard DeVaulcouleurs Supercluster according to my unpublished article? JDEM should be designed to detect this negative pressure/repulsive gravity EHV region, a very difficult task, and also detect, somewhat easier, how our local clusters of galaxies, from our own Local Group, to the Virgo Cluster and beyond, lie on the spatially curved topology surface of our local Supercluster.”
- 4) “Read Chapter 11 of: "Schroedinger's Universe - Origin of the Natural laws.”
- 5) “I always wondered did dark energy cause the big bang or is it continually being created? Maybe both?”
- 6) “i am very interested by your field because i do a research with single telescope with a team on "the top pic du midi" in France”
- 7) “The Om diagnostic – a combination of the Hubble parameter and the cosmological redshift – can help in distinguishing between the cosmological constant ($w = -1$) and dynamical dark energy ($w \neq -1$).”
- 8) Key science interests for me include (beyond dark energy) the evolution of galaxies and its relationship to large-scale structure. For those measurements, high spatial resolution (allowing resolved morphology measurements at $z \sim 1$, which requires $\sim 0.1''$ imaging) over wide fields (both for numbers of objects, and to ensure photometric consistency) is extremely valuable.

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